Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-16   (cancelled)

17.   (currently amended) A method to determine the amount of stratified flow through a

conduit, comprising:

(a) transmitting through a first portion of said conduit a first ultrasonic signal in a

generally horizontal direction from a first upstream location;

(b) receiving said first ultrasonic signal at a location downstream of said first

upstream location;

(c) transmitting through said first portion a second ultrasonic signal in a generally

horizontal direction from a first downstream location;

(d) receiving said second ultrasonic signal at a location upstream of said first

downstream location;

(e) transmitting through said first portion of said conduit a third ultrasonic signal

from a second upstream location, said third ultrasonic signal reflecting of off a surface of

said stratified flow;

(f) receiving said third ultrasonic signal at a location downstream of said second

upstream location;

(g) transmitting through said first portion a fourth ultrasonic signal from a second

downstream location, said fourth ultrasonic signal reflecting ~~of~~ off said surface of said

stratified flow;

(h) receiving said fourth ultrasonic signal at a location upstream of said second

downstream location; and

(i) computing the amount of said stratified flow in said conduit based on the travel

times of said first, second, third, and fourth ultrasonic signals.

18.   (original) The method of claim 17, wherein said first portion is not said stratified flow.

19.   (original) The method of claim 17, wherein said first portion is a gas.

20.   (canceled)

21.   (currently amended) The method of claim ~~20~~ 17, wherein said first and second ultrasonic

signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified

flow.

22.   (currently amended) The method of claim 17, wherein said ~~first and second ultrasonic~~

~~signals travel in generally horizontal directions and said~~ third and fourth ultrasonic signals travel in

generally vertical directions.

23.   (original) The method of claim 22, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow and said third and fourth ultrasonic signals are used to measure a second speed of sound corresponding to a level of said stratified flow in said conduit.

24.   (original) The method of claim 17, wherein said first ultrasonic signal is transmitted by a first transducer and received by a second transducer, said second ultrasonic signal is transmitted by said second transducer and received by said first transducer, said third ultrasonic signal is transmitted by a third transducer and received by a fourth transducer, and said fourth ultrasonic signal is transmitted by said fourth transducer and received by said third transducer.

25.   (original) The method of claim 17, wherein said step of computing includes calculating a first measured speed of sound from said first and second ultrasonic signals, and a second measured speed of sound based on said third and fourth ultrasonic signals, the discrepancy between said first and second measured speeds of sound indicating the level of said stratified flow.

26.   (currently amended) ~~The method of claim 17,~~ A method to determine the amount of stratified flow through a conduit, said method ~~is~~ being performed by a two-chord ultrasonic meter, comprising:

        (a) transmitting through a first portion of said conduit a first ultrasonic signal from a first upstream location;

7

(b) receiving said first ultrasonic signal at a location downstream of said first upstream location;

(c) transmitting through said first portion a second ultrasonic signal from a first downstream location;

(d) receiving said second ultrasonic signal at a location upstream of said first downstream location;

(e) transmitting through said first portion of said conduit a third ultrasonic signal from a second upstream location, said third ultrasonic signal reflecting of a surface of said stratified flow;

(f) receiving said third ultrasonic signal at a location downstream of said second upstream location;

(g) transmitting through said first portion a fourth ultrasonic signal from a second downstream location, said fourth ultrasonic signal reflecting of said surface of said stratified flow;

(h) receiving said fourth ultrasonic signal at a location upstream of said second downstream location;

(i) computing the amount of said stratified flow in said conduit based on the travel times of said first, second, third, and fourth ultrasonic signals.

27-31 (canceled)

32-40 (canceled)

8

41.   (currently amended) The method of claim ~~32~~ 17, wherein said step of computing said amount of said stratified flow includes calculating the level of said stratified flow in said conduit.

42.   (currently amended) The method of claim ~~32~~ 17, wherein said step of computing said ~~degree~~ amount of stratified flow includes determination of the amount of said stratified flow by computing a speed for said stratified flow.

43.   (original) The method of claim 42, wherein said speed for said stratified flow is computed from the equation

$$V_L = \frac{V_G}{1 + \sqrt{\dfrac{\rho_L}{\rho_G}}}$$

ρ_L=density of the liquid

ρ_G = density of the gas

V_L = velocity of liquid

V_G = velocity of gas.

44.   (currently amended)   ~~The method of claim 32,~~ A method to determine the amount of stratified flow through a conduit, comprising:

(a) transmitting through a first portion of said conduit a first ultrasonic signal from a first upstream location;

(b) receiving said first ultrasonic signal at a location downstream of said first upstream location;

(c) transmitting through said first portion a second ultrasonic signal from a first

9

downstream location;

(d) receiving said second ultrasonic signal at a location upstream of said first downstream location;

(e) transmitting through said first portion of said conduit a third ultrasonic signal from a second upstream location, said third ultrasonic signal reflecting of a surface of said stratified flow;

(f) receiving said third ultrasonic signal at a location downstream of said second upstream location;

(g) transmitting through said first portion a fourth ultrasonic signal from a second downstream location, said fourth ultrasonic signal reflecting of said surface of said stratified flow;

(h) receiving said fourth ultrasonic signal at a location upstream of said second downstream location;

(i) computing the amount of said stratified flow in said conduit based on the travel times of said first, second, third, and fourth ultrasonic signals, wherein said step of computing includes computing the quantity of stratified flow through the conduit by multiplying a velocity for said stratified flow by a cross-sectional area of said stratified flow.

45.   (currently amended) The method of claim 32 17, wherein said degree amount is the depth of said stratified liquid flow.

46 – 55 (canceled).

56.   (new) The method of claim 26, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow.

57.   (new) The method of claim 26, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow and said third and fourth ultrasonic signals are used to measure a second speed of sound corresponding to a level of said stratified flow in said conduit.

58.   (new) The method of claim 26, wherein said first ultrasonic signal is transmitted by a first transducer and received by a second transducer, said second ultrasonic signal is transmitted by said second transducer and received by said first transducer, said third ultrasonic signal is transmitted by a third transducer and received by a fourth transducer, and said fourth ultrasonic signal is transmitted by said fourth transducer and received by said third transducer.

59.   (new) The method of claim 26, wherein said step of computing includes calculating a first measured speed of sound from said first and second ultrasonic signals, and a second measured speed of sound based on said third and fourth ultrasonic signals, the discrepancy between said first and second measured speeds of sound indicating the level of said stratified flow.

60.   (new) The method of claim 26, wherein said step of computing said amount of said stratified flow includes calculating the level of said stratified flow in said conduit.

61. (new) The method of claim 26, wherein said step of computing said amount of stratified flow includes determination of the amount of said stratified flow by computing a speed for said stratified flow.

62. (new) The method of claim 42, wherein said speed for said stratified flow is computed from the equation

$$V_L = \frac{V_G}{1 + \sqrt{\frac{\rho_L}{\rho_G}}}$$

ρ_L = density of the liquid

ρ_G = density of the gas

V_L = velocity of liquid

V_G = velocity of gas.

63. (new) The method of claim 44, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow.

64. (new) The method of claim 44, wherein said first and second ultrasonic signals are used to measure a speed of sound for a portion of said conduit not carrying said stratified flow and said third and fourth ultrasonic signals are used to measure a second speed of sound corresponding to a level of said stratified flow in said conduit.

65. (new) The method of claim 44, wherein said first ultrasonic signal is transmitted by a first transducer and received by a second transducer, said second ultrasonic signal is transmitted by said

second transducer and received by said first transducer, said third ultrasonic signal is transmitted by

a third transducer and received by a fourth transducer, and said fourth ultrasonic signal is

transmitted by said fourth transducer and received by said third transducer.

66.   (new) The method of claim 44, wherein said step of computing includes calculating a first

measured speed of sound from said first and second ultrasonic signals, and a second measured

speed of sound based on said third and fourth ultrasonic signals, the discrepancy between said first

and second measured speeds of sound indicating the level of said stratified flow.